

## Thirty Ground Beetles New to the Fauna of Virginia, and a Milestone (Coleoptera: Carabidae)

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### ABSTRACT

Thirty species of ground beetles (Carabidae) are documented for the first time as members of the known Virginia fauna. Three other species that were originally reported from Virginia by other authors are re-affirmed in the context of the state list (*Cicindela* (*Ellisoptera*) *gratiosa* Guérin-Méneville, *Cicindela* (*Ellisoptera*) *lepida* Dejean, and *Cicindela* (*Cicindelidia*) *trifasciata ascendens* LeConte), and an additional subspecies is added to a species already recorded from the state (*Dicaelus dilatatus sinuatus* Ball). For eastern North America, Virginia seems to be the southernmost known locality for five of these species (*Amara* (*Celia*) *patruelis* Dejean, *Amara* (*Paracelia*) *quenseli* (Schönherr), *Bembidion* (*Peryphus*) *obscurellum* (Motschulsky), *Bradycellus* (*Stenocellus*) *insulsus* (Casey), and *Diplocheila obtusa* (LeConte)), and the northernmost locality for eight of them (*Anisodactylus* (*Gynandrotarsus*) *harpaloides* (LaFerté-Sénéctère), *Clivina* (*Paraclivina*) *convexa* LeConte, *Clivina* (*Paraclivina*) *sulcipennis* Putzeys, *Diplocheila major melissisa* Ball, *Eucaerus varicornis* LeConte, *Maronetus schwartzi* (Beutenmüller), *Paratachys austini* (Casey), and *Paratachys columbiensis* (Hayward)). The remaining seventeen new records are *Acupalpus* (*Tachistodes*) *pauperculus* Dejean, *Amara* (*Bradytus*) *apricaria* (Paykull), *Amara* (*Celia*) *rubrica* Haldeman, *Amblygnathus mexicanus* Bates, *Badister* (*Badister*) *maculatus* LeConte, *Brachinus adustipennis* Erwin, *Dyschiriodes* (*Dyschiriodes*) *pumilus* (Dejean), *Elaphropus xanthopus* (Dejean), *Loxandrus brevicollis* (LeConte), *Paratachys pumilus* (Dejean), *Paratachys* probably *sagax* (Casey), *Paratachys scitulus* (LeConte), *Scaphinotus* (*Irichroa*) *irregularis* (Beutenmüller), *Selenophorus* (*Celiamorphus*) *ellipticus* Dejean, *Selenophorus* (*Celiamorphus*) *granarius* Dejean, *Stenolophus* (*Stenolophus*) *ochropezus* (Say), and *Stenolophus* (*Stenolophus*) *spretus* Dejean. Information on the ecology and biology is provided for many species, as well as hints to facilitate identification where considered desirable.

*Key words:* beetle, Carabidae, Coleoptera, Virginia.

## INTRODUCTION

Carabid beetles constitute a major element in the soil and litter fauna of eastern United States, diverse in taxa, often numerous in individuals. Except for half a dozen genera, mostly of very small species, the taxonomy of the group in North America is relatively mature, and identification can be attempted with some confidence. There is even a recent faunistic treatment of the ground beetles of an eastern state (South Carolina) complete with illustrated keys and descriptions of taxa (Ciegler, 2000), and state lists exist for others. At various times in the past, the present authors have become interested in the Virginia fauna, and have collaborated closely on its investigation for over a decade. Individually or in collaboration we have published a number of papers on this subject, greatly enhancing our knowledge of these interesting insects (e.g., Anderson et al., 1995; Davidson, 1995; Hoffman, 1997, 1998; Hoffman & Roble, 2000). The accumulation of additional records over the past several years provides the opportunity for a joint contribution documenting numerous distributional data.

In the closing remarks of their epochal tabulation of North American carabids, Bousquet & Larochelle (1993: 288) stated, "We hope this catalogue will stimulate those interested in the study of Geadephaga to publish new and interesting records." The extent to which this hope has been realized in Virginia is shown by the 60 species we have added to the 446 credited to the state in 1993. Of course, many of these new state records are no more than filling in the blanks for common species not mentioned for Virginia in the literature. However, a substantial number represent range extensions of several hundred kilometers, primarily of southern species discovered along the Virginia coast, with a few boreal species extended southward along the Appalachians into the higher mountains of the Commonwealth. And, to be sure, the end \*is by no means close at hand. Taking into account only those species documented from adjacent states, or from both north and south of Virginia and certain to occur there, will add at least another 20. And who can foresee how many rare species like *Eucaerus varicornis* await serendipitous discovery, hundreds of miles from their known ranges? Or how many additional localized cave trechines may be described (e.g., Barr, 2004)? An eventual total of 550 resident Virginia carabids now seems plausible, and another decade of intensive fieldwork may see that figure realized. The thirty species here added to the Virginia list bring the total to 506, and the milestone mentioned in the title is achievement of 500 documented species, shared (Bousquet & Larochelle, 1993) only by three states and one Canadian province.

As in previous contributions, we follow the sequence

and nomenclature developed in the Bousquet & Larochelle (1993) catalogue (henceforth cited as B&L). Names of the authors of this paper are expressed as initials; those of other persons are spelled out. VDNH signifies specimens captured during surveys made by personnel of the Division of Natural Heritage, Virginia Department of Conservation and Recreation. UV indicates capture with blacklight (ultraviolet light), either at sheet or with a bucket trap, and DF signifies a drift fence-pitfall trap array. Unless otherwise specified, all of the specimens cited in the individual entries are in the collection of the Virginia Museum of Natural History (VMNH); those in the Carnegie Museum of Natural History are cited as CMNH.

## CICINDELINI

Three species in the genus *Cicindela*, not credited to the state by B&L, were added to the carabid fauna of Virginia by Knisley & Schultz (1997). We repeat these records to document the species in the context of the state list total.

***Cicindela* (Ellisoptera) *gratiosa* Guérin-Ménéville**

A population discovered in 1992 by T. J. Rawinski at the South Quay pine barrens, City of Suffolk, attests the occurrence of this species in Virginia. Specimens were collected at this site on 4 July 1992 (C. B. Knisley collection, Randolph-Macon College, Ashland, Virginia), 18 September 1992 (VMNH and C. B. Knisley collection), and 27 June 2002 (VDNH). Adults were also seen and photographed on several other dates in 2002 and 2003. This site, which contains a remnant Longleaf Pine (*Pinus palustris*) - Turkey Oak (*Quercus laevis*) sandhill barrens, is disjunct from the nearest localities for *C. gratiosa* in North Carolina by about 150 km northeast (Knisley & Schultz, 1997, map 10). The species is southeastern, occurring mainly in the Coastal Plain from Virginia to Florida and Alabama. It prefers open white sand with sparse vegetation (e. g., pine barrens, roads) and is not associated with water.

***Cicindela* (Ellisoptera) *lepida* Dejean**

This species is widespread, but localized, in the interior of North America, from Canada to Mexico, and New Jersey to Utah. Scattered disjunct populations have recently been discovered along the Atlantic Coast, from New Jersey to North Carolina (Knisley & Schultz, 1997). *Cicindela lepida* was first reported from Virginia by Knisley (1991) on the basis of a population that he discovered in 1985 at the southern end of Assateague

Island, Accomack County. No additional Virginia localities are known to us at this time. This is a species of pure, windblown dune sand habitats.

***Cicindela (Cicindelidia) trifasciata ascendens* LeConte**

Credited by B&L with a primarily lowland distribution from New Jersey to Texas (and ranging through Mexico and Central America all the way to Panama), this taxon was added to the Virginia list by Knisley & Schultz (1997) with records for Mecklenburg and Northumberland counties, and the cities of Hampton, Norfolk, and Virginia Beach. Details on the inland collection site in Mecklenburg County were provided by Hobson (1998). Five specimens (CMNH) from Norfolk have the locality data: West Branch Lynnhaven Bay, 10 September 1972, R. D. Ward. This is a water-associated species, primarily coastal and preferring saltwater mudflats, but also ranging inland in similar freshwater habitats.

CYCHRINI

***Scaphinotus (Irichroa) irregularis* (Beutenmüller)**

Our experience with the large cychrines in Virginia mandates recognition of this taxon as a valid full species, as treated by Barr (1969), rather than as a junior synonym of *S. viduus* as placed by B&L. The records for NC cited by those authors thus refer to this southern Appalachian endemic. Since Barr mentioned only North Carolina and Tennessee as states of record, the following specimens establish *S. irregularis* for the first time as a Virginia beetle, reaching its northernmost limits in the Balsam Mountains (typically in spruce forest above 4000 feet/2400 m):

*Grayson Co.*: Grindstone Campground, ca. 6.5 km west of Troutdale, 23 May 1975, RLH (1). Whitetop Mountain, 5500 ft, 10 May 1985, E. V. Gourley (1); 4 October 1986, Scott Bell (1). South slope of Mount Rogers, 4700 ft., beech-spruce woods, 24 May 1970, RLH (1); same site, 15 July 1974, R. Marshall (1). Grayson Highlands State Park, DF site below picnic area on Haw Orchard Mountain, 5000 ft., 30 August 1990, VMNH survey (7); same site, 17 September 1990 (4).

Inasmuch as *S. viduus* (Dejean) occurs in northern Virginia, citation of that state by B&L and tabulation as one of its known carabids was correct. However, distinguishing between *S. viduus* and *S. webbi* throughout their ranges is controversial at best, and they may in fact be conspecific. B&L records from GA may refer to an undescribed species known (Barr, *in litteris*) from the AL-TN-GA corner.

***Maronetus schwarzi* (Beutenmüller)**  
New northernmost locality

Described from Mount Mitchell, North Carolina, this species remains very poorly known. It was not mentioned by Barr (1969:75) in his brief summary of this genus, and was not collected at Whitetop Mountain by a pitfall line operated by VMNH for a full year in 1995.

*Grayson Co.*: in litter beside rivulet on FS 89, 1560 m, 30 May 1978, RLH (1, det T. C. Barr).

In general, the tiny cychrines of the genus *Maronetus* are creatures of shaded mountain forest where there is rich moist soil with abundant litter and humus. They are all flightless and forage for snails through the litter and loose soil, often rather deep down to hard-packed soil or rock, depending upon the substrate.

BRACHININI

***Brachinus adustipennis* Erwin**

Although listed by B&L for 17 states from Massachusetts to Texas, the majority of the Middle Atlantic States were at that time still unrepresented. Two localities in eastern South Carolina were cited by Ciegler (2000), and we now record this species from Virginia.

*Henrico Co.*: Wilson Farm, Chickahominy River, 6.4 km upstream (west) of Bottoms Bridge, 11 June 1999, I. T. Wilson, UV (1). *Isle of Wight Co.*: Antioch Pines Natural Area Preserve, 6.4 km south of Zuni, 12 May 2000, SMR (2).

Both localities, like those in South Carolina, are in the Coastal Plain, reflecting a generally lowland distribution for the species. Like most *Brachinus*, it is a creature of wetlands, in this particular species mostly riverbanks and marsh edges (*Typha*, *Scirpus*) on wet, muddy soil with some vegetation (Laroche & Larivière, 2003). Many *Brachinus* species are notoriously difficult to identify, but in eastern North American *B. adustipennis* can be recognized easily by the brownish elytra with pale epipleura, all other species having blue elytra with dark epipleura (except the mysterious *B. capnicus*, described from the Smoky Mountains from one specimen, which is entirely black, including the forebody).

CLIVININI

***Clivina (Paraclivina) convexa* LeConte**  
New northernmost locality?

This miniature version of the common *C. bipustulata* is by all accounts one of the least collected members of

the genus. Originally described from Georgia (LeConte, 1844), it has subsequently been documented from an austral range extending from New York to Texas (although records for NY, NJ, and TX were considered doubtful in B&L, which admitted only the states of AR, GA, LA, and SC). Remarkably, it is not included in the known fauna of Florida (Peck & Thomas, 1998), nor in the list of Georgia carabids compiled by Fattig (1949), despite having been described from that state. Ciegler (2000) gave only Florence as a locality in South Carolina, and Brimley (1938) cited no North Carolina records. In the light of such fragmentary information, any new locality records are of interest and we here add the first collections of *C. convexa* for two Middle Atlantic States. This also lends credence to the early records for New York and New Jersey.

**Virginia:** *Henrico Co.:* Wilson Farm, Chickahominy River, 4 km upstream (west) of Bottoms Bridge, 3 June 1999, I. T. Wilson, UV trap (1♂).

**North Carolina:** *Duplin Co.:* Faison, 31 May 1953, collector not indicated (North Carolina State University, 1).

Collections made with UV light traps by VMNH and VDNH inventories throughout southeastern Virginia have yielded hundreds of specimens of *Clivina* species. That only one individual of *C. convexa* has been trapped during this effort suggests that the species may not be particularly phototropic. Yet the use of pitfalls and litter extractions in wetland habitats has been even less successful, and the key to this Sphingean riddle remains to be discovered. The ecology and biology of *C. convexa* remain unknown (Laroche & Larivière, 2003).

LeConte's (1844) reference to a "round" and convex pronotum reflects the fact that in dorsal aspect the anterior pronotal corners are broadly rounded, as opposed to

obtusely angulate in *C. bipustulata*. The single, posteriorly placed seta on the 3<sup>rd</sup> interval is a useful distinction, but by far the most notable diagnostic character for *C. convexa* is the angularly bent apical tibial process (Fig. 1).

#### ***Clivina* (*Paraclivina*) *sulcipennis* Putzeys**

New northernmost locality

This rare beetle was cited by B&L only for FL and SC, although Ciegler (2000) had not seen material from the latter state. The discovery of a population of *C. sulcipennis* on the Eastern Shore of Virginia extends its known range minimally about 480 km north along the Atlantic Coast.

*Accomack Co.:* Assateague Island, North Gate scrub dunes DF, 10-26 June 1998, SMR and Anne C. Chazal (2); same site, 26 June-10 July 1998, SMR (1).

That only three specimens were taken at a site repeatedly sampled by pitfall traps and UV lights perhaps implies a small population, or extremely brief period of adult surface activity. Nothing is known of the ecology or biology of this species (Laroche & Larivière, 2003). All of the Virginia specimens were captured in pitfall traps in barrier beach dune scrub habitats.

#### ***Dyschiriodes* (*Dyschiriodes*) *pumilus* (Dejean)**

This minute species has been documented from a basically lowland range extending from New York to Texas (with an implausible record for Manitoba). Recently collected Virginia specimens thus merely fill in the existing lacuna between the District of Columbia and North Carolina.

*Accomack Co.:* Assateague Island, North Gate scrub dunes DF, 26 June - 10 July 1998, SMR (1). *City of Virginia Beach:* False Cape State Park, dunes north of Wash Woods cemetery, UV, 18 August 1998, VDNH survey (1).

The species is known to occur on open, wet, sandy soil with some vegetation at the edges of lakes, ponds, rivers, and salt marshes (Laroche & Larivière, 2003).

#### **TRECHINI**

The B&L list erroneously reported two trechine beetles for Virginia, but these authors also overlooked Virginia records for two congeners. Specifically, *Pseudanopthalmus pallidus* Barr and *P. rogersae* Barr are reported only for Virginia by B&L, when in fact they are known only from caves in Tennessee and Kentucky, respectively (Barr, 1981, 2004). Furthermore, B&L reported *P. rotundatus* Valentine and *P. potomaca*

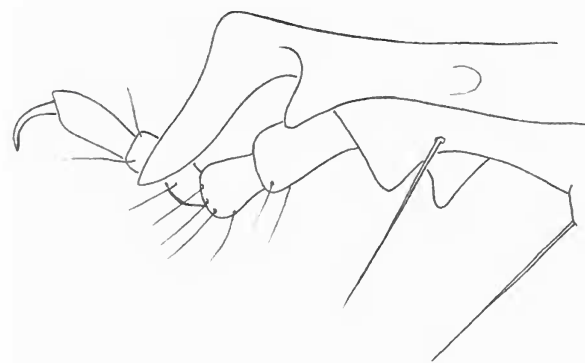


Fig. 1. *Clivina convexa*, distal end of tibia of 1st pair of legs, showing the abrupt, right-angled decurvature of the apical projection diagnostic of this species.

Valentine (as *P. potomacus potomacus*) only from Tennessee and West Virginia, respectively, but these species also have been recorded from one cave each in Virginia (Barr, 1981, 2004; Holsinger & Culver, 1988).

### BEMBIDIINI

#### **Bembidion (Peryphus) obscurellum** (Motschulsky) New southernmost record

This attractive beetle is one of the carabid species considered to be Holarctic in distribution; in North America it extends from Nova Scotia to Alaska, southward as far as Colorado and Ohio. *A priori*, one would expect a Virginia record to be from the western mountains, but this is not the case. The possibility of adventive, anthropochoric introduction to Virginia may not be excluded until additional populations have been discovered in less suburbanized areas.

*Prince William Co.*: Manassas National Battlefield Park, 1.6 km north jct Rts. 29 and 705, 21 June 1993, SMR, UV (1).

This is one example of a number of carabid species which have been able to extend their ranges considerably into northeastern North America in the last half-century, undoubtedly with the help of human disturbance. Lindroth (1963) records the species as “circumpolar, in N. America E to L. Superior,” probably true at the time. There are no specimens from the Northeast in the many old collections from New England, New York, and Pennsylvania. It now extends all the way to Maine and Nova Scotia, is common in Vermont and Pennsylvania (RLD, unpublished), and there is every reason to expect its occurrence in Virginia will be confirmed by further records and that this is a natural expansion of its range. This species prefers sparsely vegetated, moist or wet open sand and clay substrates, often well away from any water, but it also inhabits the drier areas of riverbanks and shorelines. It is also common in damp situations in disturbed areas, such as arable fields, meadows, sand or gravel pits, and even salt flats.

#### **Elaphropus xanthopus** (Dejean)

As this common species has been documented from such nearby states as Delaware and North Carolina, its absence from Virginia is merely an artifact of undercollecting. VMNH has material referable to this taxon from Dinwiddie, Greensville, Halifax, Henry, and Mecklenburg counties, May-August, all from UV lights near lakes or swamps. CMNH has specimens from the following counties: Albemarle, Botetourt, Brunswick, Buckingham, Chesterfield, Essex, Fauquier, Franklin,

Frederick, Greensville, Henry, King William, Louisa, Madison, Mecklenburg, Shenandoah, Southampton, Stafford, and Warren, and Suffolk City.

It occurs from Maine to Florida, west at least to Illinois and Missouri. It has been taken on open or sparsely vegetated wet ground with clay or sandy-clay soils on river banks, lake shores, mud flats of marshes, and in both cultivated and abandoned fields (Larochelle & Larivière, 2003).

#### **Paratachys**, probably **sagax** (Casey)

For years this common eastern *Paratachys* has been an enigma, and it more or less remains so today. It sat under a label “big-eyed *Paratachys*” in CMNH and VMNH for many years. While examining carabids in the Museum of Comparative Zoology in early 2004, Davidson found it in the LeConte collection under the name *Tachys aeneipennis* (Motschulsky), so some specimens determined in the subsequent year will bear this label. Davidson’s visit to the United States National Museum in June 2005, an attempt to resolve at least some of the tachyines of eastern North America, told quite a different story. Terry L. Erwin began to revise the subtribe Tachyina for the New World around 1970 and continued this undertaking until around 1980 (possibly abandoned because of the enormously difficult genus *Paratachys*). During this time he designated homotypes for most available names, having access to the numerous Casey types at the USNM. Erwin’s homotype of *Tachys aeneipennis* (Motschulsky) proved to be a very different animal from LeConte’s interpretation of the name. It is a *Paratachys* with very small flat eyes and certainly not the species reported here. But examination of the types of *Paratachys* in the Casey collection shows that the species described as *Tachys sagax* Casey (1918) from northern Illinois is a good match. Certainty will have to await careful dissection of a series of specimens and the type, as the species in this genus are often very similar externally. There are several other Casey species described from Texas that appear to be in the same group, and some or all may be conspecific with *P. sagax*. However, since all were described in the same paper and are simultaneously available, the name *P. sagax* is as good a choice as any for this taxon, even should some of the other names turn out to be synonymous. Therefore, we propose to refer to this species as *P. sagax* (Casey) until such time as the genus is properly revised for eastern North America. In Florida and Texas, the species are not easy to identify, because in addition to the possible synonyms, there are at least one or two other very similar species that seem to be valid. Farther north, however, there seems to be only one species with enormous, hemispherical eyes. Further characters

that distinguish this species are the darkened head and antennae, long antennomeres, concolorous pale pronotum and elytra without darker marks, transverse (therefore iridescent) pronotal and elytral microsculpture, linear trapezoidal pronotal shape, and dilation of only the first male protarsomere. We provide herein a drawing (Fig. 2) of the head and prothorax to illustrate these characters.

*Buchanan Co.*: Davenport, 9 July 1980, André Larochelle (1) (CMNH). *Carroll Co.*: Sylvatus, 27 July 1980, André Larochelle (1) (CMNH). *Charlotte Co.*: Cub Creek floodplain, ca. 4 km north of Phoenix, Rt. 695, 11 August 1994, UV light, RLH (1). *Goochland Co.*: Maidens, 16 July 1980, André Larochelle (2) (CMNH). *Greensville Co.*: Emporia, 25 July 1980, André Larochelle (1) (CMNH); Mill Swamp, 6 km east of Skippers, Rt. 660, 17 August 1998, UV light, RLH (1). *King William Co.*: Pamunkey River, 13 July 1980, André Larochelle (7) (CMNH). *City of Suffolk*: Dismal Swamp, 25 July 1980, André Larochelle (1) (CMNH). *Sussex Co.*: Assamoosic Swamp, 22 July 1980, André Larochelle (4) (CMNH); Chub Sandhill Natural Area Preserve, ca. 10 km southeast of Sussex Court House, 21 May 1996, UV light, SMR/RLH (1). *Sussex/Greensville Cos.*: Jarrett, 23 July 1980, André Larochelle (3) (CMNH). *Wise Co.*: Blackwood, 8 July 1980, André Larochelle (1) (CMNH).

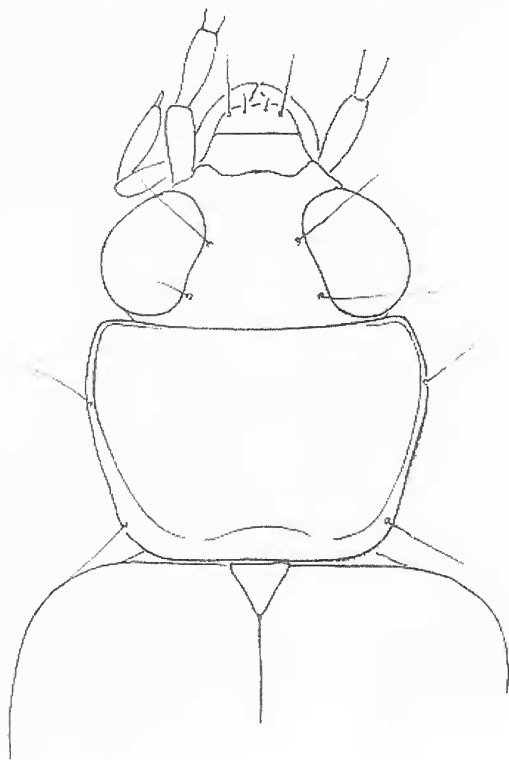


Fig. 2. *Paratachys* species, probably *P. sagax*, head and prothorax, dorsal aspect, to show enlarged eyes.

### ***Paratachys austinicus* Casey**

New northeasternmost locality

Listed only from TX and SD by B&L, this beetle has been subsequently documented for South Carolina (Ciegler, 2000). We now extend the known range still farther northward with the Virginia collections that follow. At Fort Pickett, this species was collected together with *P. columbiensis*.

*Dinwiddie Co.*: Fort Pickett, jct. Lake and Pelham roads, 2 August 1998, SMR (1). *Montgomery Co.*: Blacksburg, 3 September 1976, C. R. Parker (1). *City of Norfolk*: Norfolk, 1-2 September 2002 (1), 5-7 September 2002 (1), 20 September 2002 (4), C. A. Springer, UV (CMNH; additional specimens with similar data are deposited with Michael A. Goodrich, Eastern Illinois University).

*Paratachys* is one of the most difficult of carabid genera taxonomically, due to the small size and incredible diversity of species, especially in the Neotropical region. Many species are extremely similar externally and can be reliably separated only by examination of the male genitalia, making it difficult to determine which names (if any) actually apply even to some of our most common eastern Nearctic species. The tiny, straw-colored *P. austinicus* is a rare exception, being readily distinguished by the complete marginal groove on the elytra. All other eastern Nearctic species of *Paratachys* have the groove complete in its apical third (and bent medially at its anterior end, distinguishing this genus from the very similar *Tachys*) and again in the anterior third near the shoulder, but completely absent from the middle third. The biology of *P. austinicus* is unknown but would be of great interest to investigate, as the species is widespread in eastern North America and is already known to occur much farther north than Virginia (RLD, unpublished).

### ***Paratachys columbiensis* (Hayward)**

New northernmost locality

Recorded by B&L from several southeastern states (North Carolina to Alabama), this scarce species is apparently widespread in Virginia, although five of the following seven counties are in the Piedmont. All specimens were taken at UV light between mid-May and late September.

*Charlotte Co.*: Cub Creek floodplain, ca. 4 km north of Phoenix, Rt. 695, 29 July 1998, RLH (1). *Dinwiddie Co.*: Fort Pickett, jct Lake and Pelham rds., 2 August 1995, SMR (1); Fort Pickett, 2 km east of Birchin Lake, 5 July 2000, A. C. Chazal (1). *Halifax Co.*: swamp beside Rt 622, 4 km east of Riceville, 26 September 1998, RLH (1). *Hanover Co.*: South Anna River at Rt. 657, 21 June

1977, J. R. Voshell (1); North Anna River falls at US 1, 20 July 1977, J. R. Voshell (1). *Isle of Wight Co.*: Blackwater Ecological Preserve, ca. 7 km south of Zuni, 21 May 1996, UV, SMR/RLH (1). *Mecklenburg Co.*: Elm Hill Wildlife Management Area, Clyde's Pond, 22 August 1992, RLH (1). *City of Norfolk*: Norfolk (specimen in the Michael Goodrich Collection at Eastern Illinois University; seen by Davidson).

Among eastern Nearctic *Paratachys*, this is another relatively easy species to distinguish, at least outside of Florida (one or two presumably Neotropical species in Florida have the pronotum polished). The pronotum is polished, shiny, and devoid of microsculpture, and generally a paler orange, contrasting with the darker head and elytra. Other eastern *Paratachys* have distinct open pronotal microsculpture or are iridescent due to closely packed microsculpture lines without formation of meshes.

Little is known of the ecology of *P. columbiensis*. Larochelle & Larivière (2003) state merely "lake shores; margins of saltwater bodies." This is the northernmost published record to date, but it is already known (RLD, unpublished) to occur considerably farther north.

#### **Paratachys pumilus (Dejean)**

With no fewer than 23 eastern states (Rhode Island to Florida, west to Iowa and Texas) listed by B&L for this common species, it is only an artifact of collecting that Virginia has not been included until now. VMNH specimens are from several localities in the Coastal Plain and outer Piedmont.

*Cumberland Co.*: 7 km southwest of Columbia, low mixed hardwoods off Rt. 686, 20 April 1996, VMNH survey (4). *Greensville Co.*: Fontaine Swamp at Rt. 624, 28 January 1993, RLH (2). *Halifax Co.*: Hyco River floodplain at Rt. 501, 12 April 1998, RLH (1). *Isle of Wight Co.*: Blackwater Ecological Preserve, ca. 7 km south of Zuni, 21 May 1996, UV light, SMR/RLH (1). *Sussex Co.*: swamp beside Rt. 608, 6.8 km southeast Sussex Court House, 15 September 1998, UV light, RLH (1). *City of Virginia Beach*: False Cape State Park, Wash Woods Environmental Education Center, 18-21 May 1998, VDNH survey (1).

The specimens from Cumberland and Greensville counties were taken by berlese extraction of leaf litter from low damp woods. That from Halifax County was captured by hand during streamside "splashing." This species is less readily recognized, though it belongs to a relatively small group of species with strong open microsculpture on the pronotum. There may be several more species in this group in Florida, Texas, and perhaps along the Gulf Coast. From the Carolinas northward, so far as we know, the only similar species is *Paratachys*

*potomaca*, actually described from Virginia, and very difficult to separate externally from *P. pumilus*. According to Erwin (1981), the genitalia are distinct, and *P. potomaca* is always short-winged, *P. pumilus* fully-winged, so presumably the identification could be verified by merely lifting one elytron. However, many carabids are wing dimorphic, including both long- and short-winged forms in the same populations. Whether the wing length distinction holds true for these two species throughout their ranges remains to be determined.

The habitat of *P. pumilus* is typical of many *Paratachys*, according to Larochelle & Larivière (2003). It occurs on open ground on wet clay, muddy or siltish soil with some vegetation along the edges of standing or running waters, mud flats, wet meadows, and ditches.

#### **Paratachys scitulus (LeConte)**

This very common species was listed by B&L for virtually every state east of the Great Plains except Virginia, an exclusion that we here amend with records for the following counties: Albemarle (CMNH), Appomattox (CMNH), Botetourt (CMNH), Buchanan (CMNH), Carroll, Charlotte, Dickenson, Dinwiddie, Fauquier (CMNH), Floyd, Fluvanna (CMNH), Franklin, Frederick (VMNH, CMNH), Greensville (VMNH, CMNH), Halifax, Henrico, Lee, Louisa, Lunenburg (CMNH), Montgomery, Nottoway, Page (CMNH), Patrick, Pittsylvania, Pulaski, and Stafford, and Suffolk City (CMNH). Of these locations, only Greensville County and Suffolk City are clearly in the Coastal Plain. The species ranges west at least as far as South Dakota and Texas.

This species belongs in a group with many very similar species and should be identified with great care. In Virginia, though, it is probably the only species in which the iridescent pronotum is as pale as the elytra, contrasting with the darker head, and the elytra have a darkened (though often ill-defined) band or patch in the posterior half. It is common in a wide variety of moist situations near standing or running waters and in eutrophic marshes. It is usually on open or sparsely vegetated ground with some organic content, peat or mud or clay mixed with some plant detritus.

#### **LOXANDRINI**

#### **Loxandrus brevicollis (LeConte)**

With a predominantly lowland distribution from Massachusetts to Florida, west to Illinois and Oklahoma, *L. brevicollis* is missing from the Virginia list solely by lack of collection; actually it is widespread and abundant.

It has been taken in the following Virginia counties: Augusta, Botetourt, Cumberland, Dinwiddie, Greensville, Halifax, Isle of Wight, King George, Mecklenburg, Nottoway, Prince George, Southampton, Stafford, Sussex, and York. The apparent absence of the species from the well-collected southeastern cities (Chesapeake, Norfolk, Suffolk, Virginia Beach) is noteworthy.

The records for Augusta and Botetourt counties are exceptional for being west of the Blue Ridge. Two specimens from Augusta County are from a sinkhole pond in the Maple Flats area near Sherando (21 September 1991, RLH), and compatible with the occurrence there of other animals and plants normally restricted to lowland eastern Virginia (Fleming & Van Alstine, 1999; Mitchell & Buhlmann, 1999; Roble, 1999). Two captures from Botetourt County are from the James River floodplain northeast of Arcadia (Solitude Swamp, 8 March 1995; Sprouts Run, Rt. 622, 21 February 1998, both M. W. Donahue), and may represent westward colonization in palustrine biotopes along the river.

This is largely a species of floodplain forests near streams and ponds, preferring rich organic muck with a cover of leaves or flood detritus in shaded situations.

#### ZABRINI

##### ***Amara (Bradytus) apricaria* (Paykull)**

This Palearctic species, introduced from Western Europe, is now widespread and established over much of North America. It is transcontinental in Canada and the northern tier of the United States, south at least to Colorado, Nebraska, and South Carolina. Our single Virginia record is for:

*Floyd Co.*: jct Rts. 637 and 860, ca. 4 km ESE of Floyd, 27 August 2000, UV, RLH (1).

This is a creature of dry soils on open ground, usually with dense vegetation of weeds and grasses, and it thrives on human disturbance (pastures, meadows, ditches, gravel pits). Like most species of *Amara*, adults and larvae feed on seeds (mostly grasses) and are largely herbivorous, unlike the majority of carabid tribes which are predatory or at least opportunistic omnivores.

##### ***Amara (Celia) patruelis* Dejean**

New southernmost locality

Another Holarctic carabid, *A. patruelis* is transcontinental in northern North America, recorded as far south as California and Colorado in the west. In the east, confirmed records extend south only as far as Pennsylvania. VMNH has a single collection from a "boreal" site in the mountains.

*Rockingham Co.*: Shenandoah Mountain, ca. 1200 m, pitfall site nr jct Rts. 924 and FS 86, 17 June 1988, K. A. Buhlmann (3).

Another species of open, dry ground with sandy soil and weedy vegetation, in the North it occurs commonly in moraines, meadows, cultivated fields, sand and gravel pits, lawns and gardens, and is often near human habitation. It ranges from mountain and subalpine zones to lowlands, but farther south it may be limited by climate to more mountainous regions.

##### ***Amara (Paracelia) quenseli* (Schönherr)**

New southernmost records

With a presumed natural Holarctic distribution, *A. quenseli* occurs from Alaska to Nova Scotia, south as far as Oklahoma, New Mexico, Arizona, and California in the west, but until now it was only known south to Maryland and Ohio in the East. Unlike *A. patruelis*, the known Virginia records are not from the western mountains, but are confined to the Atlantic seacoast, probably due to the sandy habitats.

*Accomack Co.*: Assateague Island, Wildcat Marsh, 22 July 1988, A. C. Chazal (2); Assateague Island, Wash Flats, dune DF, 1-14 October 1998, A. C. Chazal (1). *City of Virginia Beach*: Dam Neck Navy Base, dune DF site, 30 November 1990, K. A. Buhlmann (6).

The specimens from Wildcat Marsh were captured by "sweeping salt marsh edge," apparently an unusual way to collect for any member of this genus. But adults of many species can be found climbing grasses to harvest seeds. This species is particularly partial to dry sandy soils, so the presence of water is incidental. It is common in sand and gravel pits, sand dunes, beaches, and riparian sand deposits, as well as (if sandy enough) cultivated fields, meadows, and roadsides.

##### ***Amara (Celia) rubrica* Haldeman**

Previously recorded from nearly all states east of the Appalachians, this species has been merely overlooked in Virginia. It is, however, not frequently collected here, as implied by the few records. It ranges from Maine to South Dakota (but only Quebec and Ontario in Canada, unlike most *Amara* species which tend to be more northern), south to Kansas and Tennessee west of the Appalachians, and south to Georgia east of the mountains.

*Accomack Co.*: Assateague Island, Wildcat Marsh, 22 July 1998, A. C. Chazal (1). *Augusta Co.*: 8.2 km west of Stokesville, 15 October 1988, B. Flamm (1). *Mecklenburg Co.*: Elm Hill Wildlife Management Area, 13 km SW of Boydton, DF in sandy floodplain, 25 August-1 October 1995, RLH (2). *City of Virginia Beach*:

False Cape State Park, 30 August 1995, SMR (1).

The specimen from Assateague was taken along with *A. quenseli* by sweeping salt marsh plants. This is not surprising as the habitat of these species is virtually identical, and both are prone to climbing grasses in search of seeds.

#### LICININI

##### ***Diplocheila major melissisa* Ball**

New northernmost locality

In distinguishing two subspecies of *Diplocheila major*, Ball (1959) defined a northern and interior distribution for the nominate race: Rhode Island west to South Dakota, south to Missouri and Kansas. Ball's new subspecies *D. major melissisa* was based on specimens from the Gulf Coast region: Florida to Texas. The peripheries of these two areas were adjusted slightly by B&L, who added North Carolina to the range of *D. major melissisa*, but in general a rather broad hiatus remained between the subspecies. With the collection of *D. major melissisa* in eastern Virginia, we extend its known range slightly northward along the Coastal Plain.

*Greensville Co.*: DF site at end of Rt. 666, ca. 1.6 km east of Claresville, 28 April-10 May 1993, VMNH survey (1). *Isle of Wight Co.*: Blackwater Ecological Preserve, 7 km south of Zuni, 12 July 1994, SMR (1). *Sussex Co.*: Chub Sandhill Natural Area Preserve, ca. 10 km southeast of Sussex Court House, 21 May 1996, SMR/RLH (1).

*Diplocheila major* is a hydrophilous species and can disappear below the water surface for some time when disturbed. According to Larochelle & Larivière (2003), it is a lowland species of open or shaded ground with wet muddy or clay soil with dense vegetation. It favors the edges of eutrophic ponds, flood-plain forests, and low deciduous forests.

##### ***Diplocheila obtusa* (LeConte)**

New southernmost locality

Although known from a transcontinental range (New Brunswick to British Columbia, south to New Mexico and Arkansas in the West), this small licinine has not been recorded south of Pennsylvania in the East. We are aware of but a single capture of the species in Virginia:

*Montgomery Co.*: New River floodplain at Radford, 5 May 1973, S. Trinandwan (1).

That only one specimen is known from one of the Virginia counties most intensively collected for insects suggests its restriction to a very specific and undercollected habitat. Most Nearctic species of *Diplocheila* prefer very wet habitats, but *D. obtusa* is

atypical in that it prefers much drier habitats in open situations with sparse grass, typically pastures and cultivated fields, much like many *Amara* species (RLD, unpublished). Larochelle & Larivière (2003) are quite specific, citing "firm, often sloping, well-drained, warm, dry, gravelly, sandy, stony or chalky soil covered with sparse grass (e. g. *Phleum*)." In addition to pastures and cultivated fields, they list a wide variety of open habitats: "Grasslands, ... lawns, vacant lots, hills, roadsides, vicinity of sidewalks (even of cities), gravel pits, sand pits, and upper zone of lake shores and river banks." The paucity of Virginia material, therefore, may reflect limited collecting in what appear to be dry and unsuitable habitats. More likely, though, since we know of only one other record south of Pennsylvania (CMNH has one specimen from Randolph County, West Virginia), the species is rarer, with spotty distribution, as one proceeds southward.

##### ***Dicaelus dilatatus sinuatus* Ball**

The species is already recorded from Virginia in the form of the nominate subspecies, but we herein add the other subspecies. Specimens available to its author when this subspecies was proposed (Ball, 1959) defined an "interior" distribution: western Pennsylvania to Iowa, south to Tennessee. Its discovery in southwestern Virginia is therefore not unexpected, considering the general biotic affinities of that region (e.g., the presence of *Cyclotrachelus incisus*: Davidson, 1995). All of the following localities are either in or at the eastern edge of the Appalachian Plateau Physiographic Province:

*Dickenson Co.*: Breaks Interstate Park, 10 June 1972, RLH (1); also 30 June-17 July 1991, VMNH survey (1). *Lee Co.*: The Cedars Natural Area Preserve, 10 km west of Jonesville, 5 September (1) and 9-11 September 1995 (2), SMR. *Russell Co.*: Carterton, 11 June 1996, SMR (1); Beartown Mountain, east of Rosedale, 4 June 1988, C. A. Pague (2). *Russell-Tazewell Cos.*: Little Fork Ridge, 2600 ft., 6 July 1977, D. W. Ogle (1).

Geographic variation in this species is interesting and was discussed at length by Ball (1959). In the concept of that author, the nominate subspecies occurred from New Hampshire and Connecticut to Virginia, and, although separated from *D. d. sinuatus* by the central Appalachians, "...they are connected by a zone of intergradation probably some 600 miles in extent (approximate linear distance from Durham, North Carolina to Mobile, Alabama)." This extensive region also includes the type localities of three named forms, which were not considered valid by Ball. Further attention to this curious situation (a large, U-shaped range with only the extreme ends distinguishable) is not within the scope of this

treatment, beyond consideration of its expression in Virginia. As implied by its name, the subspecies *D. d. sinuatus* was defined in large part by the shape of the pronotum (widest anteriorly and curved mesad posteriorly), differing in *D. d. dilatatus* (broadened gradually toward the posterior angles). Our material amply confirms this difference (Fig. 3), great enough to suggest even species-level differentiation were it not for Ball's (1959) assertion of extensive pronotal variability farther south. He considered material from as close to Virginia as Durham, NC, to be intergradient, but our samples closest to that locality (from Mecklenburg and Pittsylvania counties) appear to be typical *D. d. dilatatus*.

The prominence of the anterior pronotal angle in *D. d. dilatatus* and intergrades, evident in Ball's original drawings (1959: figs. 96a-c), is an additional distinction. Ball also mentioned a somewhat greater size for *D. d. sinuatus*, which is certainly confirmed by our specimens (over 24 mm long and thus averaging about 3-4 mm longer than selected large *D. d. dilatatus* from localities in eastern Virginia).

A goal for future in-state collecting efforts should be to establish whether the ranges of the two subspecies come into contact in southwestern Virginia, and if so, whether intergradation or character displacement occurs. As presently known, the nominate form is clearly northern and eastern within the state, with only a few records west

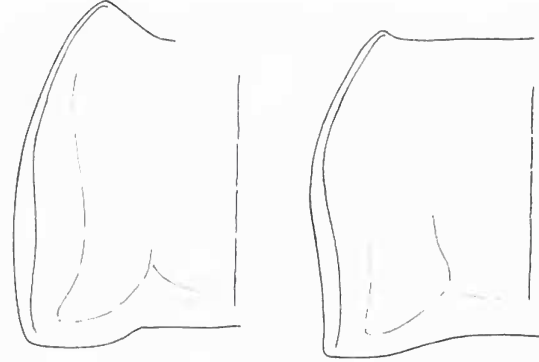


Fig. 3. Outline of left side of prothorax of *Dicaelus dilatatus dilatatus* (left) and *Dicaelus dilatatus sinuatus* (right).

of the Blue Ridge (Fig. 4).

This is largely a species of deciduous forest and forest edges, usually on moist soil in shaded situations (RLD, unpublished). Less often, according to Larochelle & Larivière (2003), it can be found in adjacent open areas (open fields, grasslands, pastures, cultivated fields) or mixed forests (with pine) on shaded moist soil with abundant litter. The species is a frequent, but not obligate, feeder on snails.



Fig. 4. Distributional records for *Dicaelus dilatatus dilatatus* (dots) and *Dicaelus dilatatus sinuatus* (diamonds) in Virginia.

**Badister (Badister) maculatus** LeConte

With a known distribution extending from New Jersey to Florida, west to Indiana and Louisiana, recording the species from Virginia is a mere formality. VMNH specimens have been taken in Accomack, Charlotte, Dinwiddie, Greensville, Halifax, Isle of Wight, and Mecklenburg counties, all mid-May to mid-June except for three taken August 11 in Accomack County. All 18 specimens were attracted to UV lights, as also noted for the species in South Carolina (Ciegler, 2000). The absence of material from the relatively well-collected southeasternmost cities (Chesapeake, Norfolk, Suffolk, Virginia Beach) is noteworthy.

Habitat requirements are not well-known compared with other *Badister* species, which typically inhabit swampy places with tall reed-like vegetation where they run on the leaf blades (e.g., *Typha*, *Carex*). It is possible this is typical *B. maculatus* habitat as well. Larochelle & Larivière (2003) state merely "flood-plain forests (e. g., cypress). Shaded ground; wet soil," all that is so far known of the biology of this species.

## HARPALINI

**Anisodactylus (Gynandrotarsus) harpaloides** (LaFerté-Sénéctère)

New northeasternmost locality

According to B&L, this species occurs in a southern-interior range: Florida to Texas, north to Tennessee and Oklahoma, with records from Georgia, North Carolina, and South Carolina considered doubtful. However, since *A. harpaloides* has been confirmed for South Carolina by Ciegler (2000), and we have a dependable record for eastern Virginia, the records for Georgia and North Carolina are probably valid.

*Greensville Co.*: pitfall site at end of Rt. 666, ca. 1.6 km northeast of Claesville, 3 June 1993, VMNH survey (1).

The capture site, on a flat, sandy knoll under *Pinus echinata*, is probably not the preferred habitat since only one specimen was captured during a 13-month sampling period. This is a lowland species of drier open areas. Larochelle & Larivière (2003) describe the habitat as "pastures and cultivated fields...open ground; well-drained soil covered with sparse vegetation."

**Stenolophus (Stenolophus) ochropezus** (Say)

Virginia is one of the few states from which this extremely common and widespread species has not been

reported. VMNH material is from Accomack, Augusta, Bedford, Charles City, Charlotte, Chesterfield, Dinwiddie, Floyd, Franklin, Giles, Goochland, Greensville, Hanover, Halifax, Henry, Highland, Isle of Wight, Mecklenburg, Middlesex, Montgomery, Nottoway, Patrick, Pittsylvania, Rockbridge, Rockingham, Russell, Smyth, Tazewell, Warren, and Washington counties, and the cities of Chesapeake and Virginia Beach. CMNH material adds Amelia, Appomattox, Brunswick, Buchanan, Buckingham, Essex, Fairfax, Fauquier, Fluvanna, King William, Louisa, Madison, Prince Edward, Prince William, Scott, Spotsylvania, Surry, Sussex, Westmoreland, and Wise counties, and Suffolk City.

The species comes frequently to lights and seems to occur in virtually any kind of freshwater habitat, including temporary pools and merely damp ground without any standing or running water.

**Stenolophus (Stenolophus) spretus** Dejean

Recorded by B&L from an apparently coastal lowland distribution from New Jersey to Texas, and up the Mississippi River to Arkansas, but not yet recorded from Virginia. VMNH specimens are from two localities on the Atlantic seacoast:

*Accomack Co.*: Assateague Island, White Hills, 1 September-1 October 1998 (1); Assateague Island, pond west of Ragged Point trail, 11 August 1998 (1); Assateague Island, North Gate dunes, 24 June 1998 (2), all VDNH survey. *City of Virginia Beach*: False Cape State Park, south end, mid-August 1998 (1), VDNH survey.

This is probably another wetland species, but nothing is known of its habitat. It comes to lights in large numbers. Larochelle & Larivière (2003) list only one reference (Kirk, 1969), which gives a South Carolina record from "the edge of a pond."

**Acupalpus (Tachistodes) pauperculus** Dejean

This is another widespread species recorded from nearly every eastern state except Virginia. It seems, however, to be rarely taken there, the VMNH collection containing only two specimens.

*Floyd Co.*: Buffalo Mountain Natural Area Preserve, small stream on Rt. 758, 6.8 km west of the Blue Ridge Parkway, 5 July 2003, UV trap, RLH (1). *Greensville Co.*: Garner's Millpond, 11 km SW of Skippers, 19 June 1989, UV light, RLH (1).

It occurs in a wide variety of wetland habitats, temporary pools, and damp places without standing or running water.

**Bradycellus (Stenocellus) insulsus** (Casey)

New southernmost localities

Existing records for this species suggest a distinctly northern distribution: New Hampshire and Ontario west to Michigan. Two VMNH specimens agree closely with Lindroth's (1968) diagnosis, differing from individuals of the similar *B. nigriceps* (det. G. E. Ball) by their more obtuse posterior pronotal angles, less microsculptured pronotal base, and especially the much more iridescent elytra (caused by denser, more transverse microsculpture).

*Accomack Co.*: Assateague Island, Chincoteague National Wildlife Refuge, wildlife loop trail, 8 July 1998, UV light, SMR (2).

A series in CMNH from Tucker County, West Virginia, helps bridge the gap between records from New York and Virginia. Larochelle & Larivière (2003) took specimens along the borders of ponds and slow rivers on damp open ground of clay or mud with some vegetation.

**Amblygnathus mexicanus** Bates

Material of this species examined by Ball & Maddison (1987) represented a basically lowland distribution extending from South Carolina to Panama, with a single disjunct record for New Jersey. After a decade of absence from our collections made in eastern Virginia, *A. mexicanus* has at last made an appearance, which helps confirm the validity of the New Jersey locality, but also emphasizes that, locally at least, this is not a common species.

*City of Suffolk*: South Quay pine barrens, ca. 10 km SSE of Franklin, 5 August 2003, SMR (2), both at UV light.

The sample taken on 3 August at South Quay also contained three specimens of the related *Amblygnathus iripennis* (Say) (recorded from Virginia by Hoffman & Roble, 1999), suggesting sympatry if not in fact syntopy as well. The two species can be separated easily by the pronotal characters illustrated by Ball & Maddison (1987: rounded hind angles in *A. mexicanus*, sharp hind angles in *A. iripennis*). Virtually nothing is known of the biology or habitat of this genus, most specimens having been taken at light. Both species apparently come readily to light if the source is close enough to the habitat, and long series in many collections suggest proximity to water, probably wet sandy and/or mucky swampy situations. The striking iridescence in many carabids seems often in some way related to a preference for soupy, mucky habitats, e.g., *Loxandrus* (and many other loxandrine genera), many *Badister*, many *Pterostichus*, many *Stenolophus* (*Stenolophus*) and many *Paratachys*. But there are some notable exceptions, e.g., the very iridescent *Selenophorus*

*opalinus*, which seem to prefer drier, open habitats.

**Selenophorus (Celiamorphus) ellipticus** Dejean

Recorded by B&L from most of eastern United States, New England, and Ontario south to Florida and west to Texas, Kansas, and Wisconsin, this small harpaline is known from several states adjoining Virginia. It has thus far been taken in Virginia at many more localities than its close relative, *S. granarius*, even though the two seem to have similar habitat requirements.

*Cumberland Co.*: 2 km SW of Columbia, pitfall site in recently clear-cut area, J. C. Mitchell, 17 May 1990 (1), 16 July 1990 (1), 15 August 1990 (2), 2 November 1989 (1). *Isle of Wight Co.*: Blackwater Ecologic Preserve, 10 km south of Zuni, 4 June 1985, C. A. Pague (1). *Mecklenburg Co.*: Elm Hill Wildlife Management Area, 12 km SW of Boydton, 11-29 May 1995, VMNH survey (3); same locality, at Clyde's Pond, 17 June-10 July 1995, VMNH survey (1). *Prince Edward Co.*: pasture near Rice, 14-17 June 1981, R. F. Bellinger (2). *City of Suffolk*: Back Bay, 5 April 1980, André Larochelle (CMNH 17).

This species and the following are very similar, difficult to distinguish without experience. Lindroth (1968) mentions the more produced pronotal front angles and less depressed pronotal disc near the hind angles typical of *S. ellipticus*, but these characters are not clearly different in all specimens. Perhaps the most reliable external difference is the more slender antennomeres of *S. ellipticus* (noticeably shorter and broader in *S. granarius*). The aedeagus is diagnostic, *S. ellipticus* with a large apical sclerite and a more proximal patch of smaller spines, *S. granarius* with a differently shaped apical sclerite and lacking the patch of smaller spines. The tip of the aedeagus is also diagnostic, and one can identify males without dissection if the aedeagal tip is exposed. The apical disc is transverse in *S. ellipticus* and thus very flat in side view, barely rising above or below the plane of the apical blade. In *S. granarius*, the apical disc is expanded dorsally and ventrally, projected above and below the plane of the apical blade and thus quite noticeable in side view. Larochelle & Larivière (2003) cite this species from dry, sandy soil covered with some vegetation in a variety of open habitats.

**Selenophorus (Celiamorphus) granarius** Dejean

This is yet another instance of a widespread species recorded from many eastern states but so far not for Virginia. VMNH records are from a single coastal locality.

*City of Virginia Beach*: Dam Neck Navy Base, dune pitfall site, VDNH survey, 30 April 1991 (1), 14 May

1991 (1), 23 May 1990 (3), 1 August 1990 (2), 12 October 1990 (1), 30 November 1990 (2).

See the previous species for remarks on distinguishing between the two. Larochelle & Larivière (2003) mention "open ground; well-drained, dry, sandy soil covered with sparse vegetation" in a variety of open land habitats, forest edges and sparse woods, virtually the same as *S. ellipticus*. It would be interesting to know whether there are some subtle differences between the two species in habitat requirements.

### LACHNOPHORINI

#### ***Eucaerus varicornis* LeConte**

New northernmost records

This small, orange-brown carabid with contrasting black head is the only Nearctic member of this predominantly Neotropical genus (14 described species [Reichardt, 1977, including the congeneric *Lachnaces*], and many undescribed). Until now it has been thought to have a Gulf Coast distribution: Florida, Alabama, Louisiana, and Texas (B&L). The discovery of this species on the Delmarva Peninsula extends this area some 950 kilometers northeast along the Coastal Plain from Putnam County, Florida (Peck & Thomas, 1998).

**Maryland:** *Dorchester Co.*: Cambridge, 22 November 1958, P. J. Spangler (USNM, 1♂).

**Virginia:** *Northampton Co.*: Savage Neck Natural Area Preserve, ca. 6 km WSW of Eastville, pitfall site by interdunal pond, 28 July-27 August 1999, SMR (1♂).

The genus was not recorded for South Carolina by Kirk (1969, 1970) or Ciegler (2000). There are no North Carolina specimens in the North Carolina State University collection. It has not been found elsewhere in Virginia despite a decade of pitfall and blacklight trapping in the Coastal Plain by VDNH and VMNH. Its rarity in collections is probably due in large part to its being short-winged and incapable of flight in all specimens seen. Its small size, too, makes it less susceptible to pitfalls. And it may be that extremely stenotopic habits and very small, widely disjunct relict populations north of the main body of its range contribute to the difficulties in finding this elusive species.

The beetle itself is about 3 mm in length, its narrow forebody and broadened, convex, ovoid elytra imparting the general appearance of a *Trechus*. A superficial recognition character is the bicolored antennae with the proximal six articles light brown, the distal five white. Anyone not familiar with carabid taxonomy may have difficulty identifying *E. varicornis* with most keys since

the apical maxillary palpomere is falsely subulate and might therefore lead one to the tribe Bembidiini. On close examination, however, one can see that the apical palpomeres are elongate, at least as long as the penultimates, and are formed as one single piece that is widened in the proximal three quarters, then tapered abruptly to a slender finial in the apical quarter. To add to the illusion, the proximal three quarters is densely pubescent and the distal quarter glabrous. There is no suture between the narrowed glabrous tip and the swollen hairy base because it is all one segment. The truncate elytra will also help the observer place this interesting species among the tribes of "Truncatipennes" rather than Bembidiini. In our part of the world, the strongly contrasting bicolored antennae will also eliminate Bembidiini, though in the Neotropical region there are apparent mimicry complexes in which eucaerine Lachnophorini and tachyine Bembidiini (and even perhaps some Loxandriini) have patterned antennae. We do not know whether the superficial similarity in the palpomeres of lachnophorines and bembidiines is an example of mimicry, or merely a functional convergence due to similar habitat and biology.

Davidson has taken *E. varicornis* in shaded forested swamps, always in very wet spots near water, walking at night on leaves and roots. Larochelle & Larivière (2003) record the habitat as "swamp-forests and borders of swamps. Close to water. Shaded ground; wet soil covered with some vegetation (e.g., *Cladium*). Nocturnal; sheltering during the day in leaf litter about sedge roots, in half-submerged logs, or under boards." Löding (1945: 22) cites the species from "under boards near swamp along Mobile & Ohio R. R. tracks."

### ACKNOWLEDGMENTS

An enormous number of collections of Virginia carabids was assembled by Andre Larochelle in the summer of 1980, and donated in part to the Carnegie Museum. Some of this material, cited for a number of species in the foregoing list, contributed greatly to our knowledge of distribution. We are also indebted to the diligence of several VDNH staff members, notably Anne C. Chazal, who collected extensively in many parts of Virginia. VDNH staff member Irvine T. Wilson provided material from light trap collections obtained on his private property, including one species not otherwise captured in the state. Warren E. Steiner, Jr., provided information on USNM material of *Eucaerus varicornis*, and Robert E. Blinn facilitated search through the North Carolina State University insect collection for relevant records. We are very much indebted to these helpful colleagues.

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